

Bulletin University of Montana, No. 22,
Biological Series No. 8.

University of Montana Biological Station

AT

FLATHEAD LAKE.

Post Office, Bigfork, Montana.

SIXTH ANNUAL SESSION,

JULY 18 TO AUGUST 20.

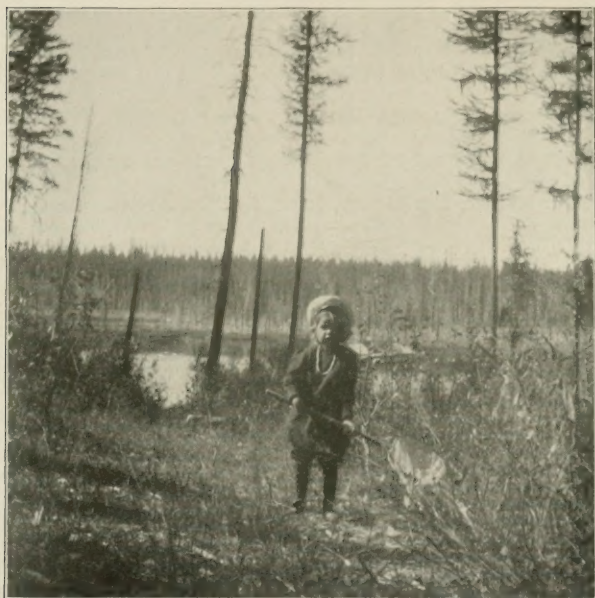


FIG. 32. YOUNG ENTOMOLOGIST.

ANNOUNCEMENT

FOR THE

SUMMER OF 1904.

University of Montana, Missoula, Montana, 1904.

Entered August 24, 1901, at Missoula, Montana, as second class matter, under act of
Congress July 16, 1894.



ANNOUNCEMENT.

The Lake Laboratory or Biological Station of the University of Montana is designed to provide opportunity for investigation of the biology of the lake and mountain region, and for giving courses of instruction in botany, zoology, entomology, nature study and photography. The work is adapted to students of the University and of high schools, teachers of the state, inexperienced beginners in natural history, and original investigators. The following statements give an outline of the plans for the summer of 1904.

STAFF OF INSTRUCTORS.

Oscar J. Craig, President of the University, Lecturer.

Morton J. Elrod, Prof. of Biology, Director of the Station, Zoology and Entomology.

Maurice Ricker, Principal, Burlington (Iowa) High School, Plankton, Photography.

James M. Hamilton, Prof. of Psychology, Systematic Botany and Nature Study.

Mrs. Edith Ricker, Burlington, Iowa, Station Artist.

LOCATION.

The field laboratory is located on the bank of Swan River at its outlet into Flathead Lake. This location affords a fine harbor for boats and a good camping site for the tents of those attending. The adjacent region contains forests, ponds, lakes, swamps, cultivated fields, mountains, rivers and ravines. It is rich in animal and vegetable life. The lake offers rare opportunities for collecting, and presents some beautiful scenery. East of the lake the Mission range comes abruptly to the water's edge. The range slopes from the Swan river on the north to the high peaks, ten thousand feet, at the southern end, and its scenery is wild, rugged and grand, truly Alpine in character, and rivaling the Alps in beauty and magnificence. West of the lake are the Cabinets. Near the Station Swan lake, Rost lake, Echo lake, and other waters, are easily accessible. Daphnia pond, a few minutes walk from the Station, is rich in pond life, while Estey's pond, about as far again, is fully as productive. The Swan range is easily accessible from the Station, and Alpine summits are annually visited. The scenery is very fine, and Alpine collecting is remarkably good. The Station is not difficult of access. The stage and boat rides are easy, with charming scenery constantly in view.

EQUIPMENT.

The building is a convenient out-door laboratory, with tables for a dozen students. The station work has entirely outgrown the building. Many of the lectures are given out of doors in the yard. The fine summer weather permits of much laboratory work out of doors. There is a dark room for photography. There are three boats which are the property of the Station. Other boats may be had at any time. Microscopes, glassware, books and utensils will be supplied from the University. Botanical collecting and drying material will be supplied.

Students in Ornithology must supply their own guns or field glasses. Necessary ammunition will be supplied at cost. Students in Photography will furnish their own cameras and plates. The necessary chemicals for development will be supplied free. Students who live in tents will supply their own tents and bedding.

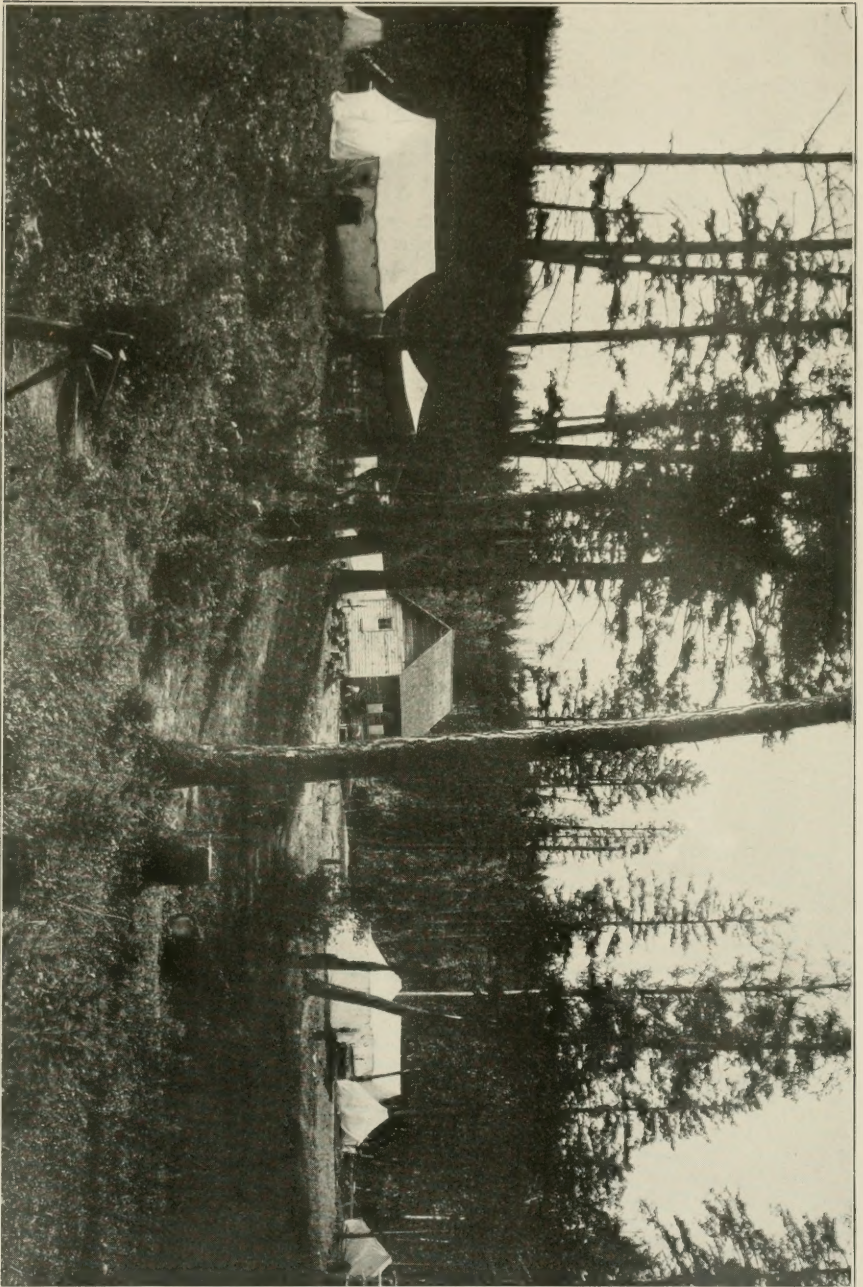


Fig. 33. Laboratory, with tents. The river is immediately in front of the building. See Figure 39 for comparison
Photo by J. M. Hamilton, 1903.

COURSES OF STUDY.

The following scheme will give those who wish to attend an idea of the kind and character of the work that may be done.

Zoology:—

(a) Laboratory and field work, including dissection or microscopic study of type forms, with field work and instruction in collecting and preserving for laboratory use and permanent collections.

(b) Field and laboratory course in entomology. Instruction in collecting, preserving and labelling insects. Dissection and study of type specimens. A study of injurious insects.

(c) Ichthyology. Special course devoted particularly to the lake and river fishes and their food supply. The course will include plankton study.

(d) Ornithology. A study of birds, with methods of collecting, making and preserving skins; habits and lives of birds of the rich avian region adjacent.

Botany:—

(a) Laboratory and field course; study of type forms. The course will consist of collecting trips in the field where common species of the different orders are found, classification of the more common species, study of structure, with methods of preservation, both dry and in liquid, for immediate and permanent use.

(b) Ecology. General course including local ecological problems and local plant geography. For this the region offers a rich field.

Photography:—

No regular course will be given in this subject, but every aid which the station can give will be given those who wish to become proficient in this art. Students in photography must supply their own plates or films and paper. There is a dark room at the laboratory and the scenery in the vicinity gives ample scope for a series of negatives either in landscape or of scientific subjects.

Nature Study:—

A course of study and practical work will be outlined which will afford both a fund of information on which to draw during school work and at the same time secure a collection of material to be used in illustration. The scope of the work will include zoology, botany, geology, and physiography of the region.

Special Work:—

Students and investigators will be encouraged to pursue some special study, taking such problems as may be pursued with profit during the session.

It must be understood that while the daily lectures are given to all, yet each individual works alone, pursuing such study as may be best fitted to his ability and requirements. The beginner has the same opportunity as the advanced student. Realizing that study of biological subjects is not extensive in the state, preparation is made for those who have not pursued such study.

INVESTIGATION.

The laboratory was intended primarily as a place for investigation. The rich field offers rare opportunities for persons of ability who will spend one or more summers. While the building is inadequate to the demands of the people in attendance, nevertheless the conditions are favorable for continuous experimentation and every facility is offered to those who wish to conduct investigations. The publications that have emanated from the laboratory cover more than 350 pages, with about 65 plates. Many articles have appeared elsewhere as the result of station experiments.

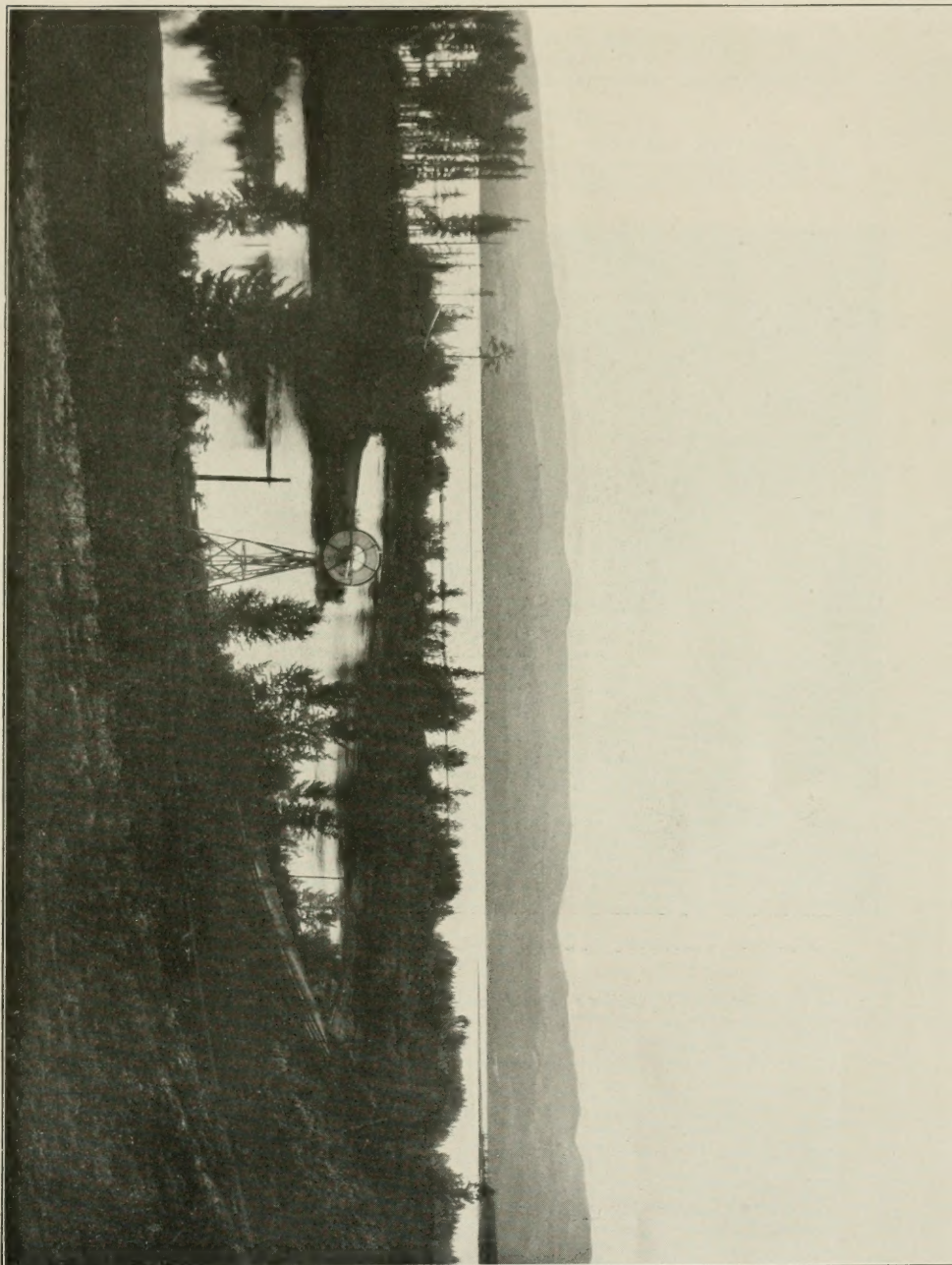


Fig. 34. Upper end of Flathead lake, from hill by Station. Swan river to the left. Delta of Flathead river extends out in lake. Photo by M. J. E.

UNIVERSITY CREDITS.

Students from the university may pursue study at the Station and receive credit for such work as may be equivalent to University courses. Students taking elementary study may receive preparatory credits.

METHODS OF INSTRUCTION.

The work will consist very largely of field collecting and observation, study of relation to environment, supplemented by laboratory dissections and microscopic examination. The general courses will enable teachers



Fig. 35. Unloading at Swan Lake, Excursion of 1903. Photo by Mrs. F. M. Fultz.

to familiarize themselves with methods of field work, and give a store of information from which to draw in nature study subjects. The general courses also give opportunity to students and others to pursue lines of study with better facilities for out door work with fresh material, than is generally to be had in regular university work.

The expeditions are primarily to give opportunity for the study of animals and plants in their natural environment. By this means more lasting interest is aroused, and more accurate information is obtained.

LECTURES.

Almost every day a lecture on some biological topic will be given at the laboratory. Some of the lectures given in 1902 have been incorporated in Bulletin University of Montana, Biological Series No. 5. Thirteen lectures, covering 90 pages, with 5 plates and 27 figures, are included. Some of the lectures which will be presented in 1904 are the following:

Flathead Lake as a Collecting Field.
The Enemies of the Forests.
Alpine Vegetation as Observed on MacDougal Peak.
The Entomostraca of Flathead Lake.
Air Currents in Mountains.
Fresh Water Biological Stations in America.
Structure of Orchids.
Adaptation in Insects.
Protective Coloration and Mimicry as Seen About the Station.
Photography as an Aid to Science.
Intelligence of Animals.
The Value of Nature Study to Pupils.

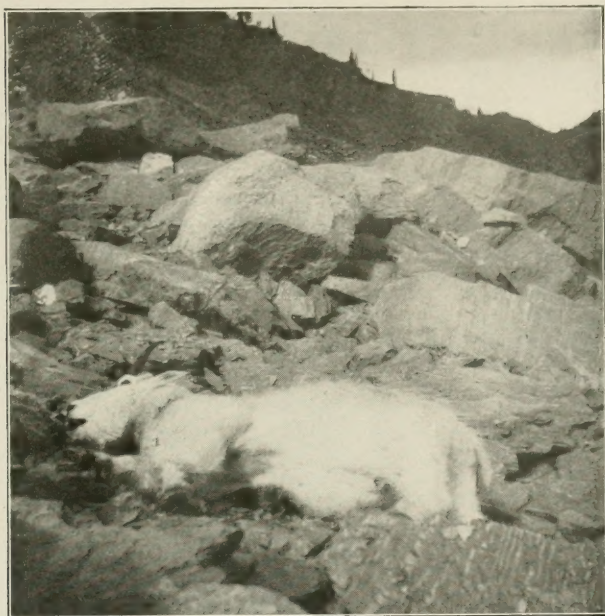


Fig. 36. A Museum Specimen from Baptiste Mountain, 1903.

EXCURSIONS.

The following excursions will be taken during the session of 1904, unless the weather is unfavorable:

1. A trip to Swan Lake, through the forests, with stop over night at the lake. This is a beautiful lake in the mountains, of great interest biologically and geologically.

2. A trip to Rost Lake, at the base of the Kootenay Mountains. This is a lake almost filled up, a fine collecting field. It is an admirable location for camps.

3. An ascent of MacDougal Peak via an Indian trail, to an altitude of 7,725 feet. This will afford opportunity for alpine collecting, and will present some of the most sublime scenery in the world.

4. A trip around Flathead Lake, making study of its banks, bays, and swamps.

These trips will be under the personal supervision of the Director of the Station. Those taking the trips must bear a proportionate share of

the expense necessary. Such trips will prove of great value and interest biologically aside from the pleasures they bring. These trips are not for mere pleasure, but for scientific study. Daily conferences are held to report on observations and to make suggestions.

HOW TO REACH THE STATION.

Students via Northern Pacific will get off at Selish. Stage tri-weekly runs to Flathead Lake (35 miles), connecting with steamer Klondyke, which runs across the lake. Stage fare, one way, \$3.00, round trip, \$5.00, trunks extra. Boat fare across the lake, one way, \$3.00, round trip, \$5.00. Stage leaves Selish on Mondays, Wednesdays and Fridays, connecting with the steamer, returning the same day. A daily stage, carrying mail and passengers, runs from Selish to Polson via Mission and Ronan. Passengers may thus travel to Polson daily. Both stages leave from the hotel at Selish, reaching Polson by different routes. They are under different managements.

Students via Great Northern will get off at Kalispell, connecting by stage with the steamer Klondike at Demersville, a short distance from Kalispell.

BOARD AND ROOM.

Most of those at the Station, including the staff, live in tents. A few tents are for rent. Day board may be had at Sliter's hotel for \$5.00 per week. Board and room may be had at \$7.00 per week. Many prefer to do their own cooking. The stores supply all the necessities of life, while the region affords an abundance of fruit and vegetables. Daily mail gives easy communication with the outside world. There is also telephone connection. In addition to Sliter's hotel there are other places where meals may be secured.

RECREATION.

Change is rest. To take a day off and go a fishing often gives new lease of life. The tingle of the nerves when the gamey fish tugs at the line is to forget care and to be thoroughly alive. Many will wish to combine an outing with study. In fact, one of the attractions of the place is its natural advantages so as to induce out-door exercise and study. The lake and rivers make rowing a good pastime. The photographer has a field of wondrous richness and varied interest. A fine sand beach makes bathing a delight, and it is indulged in. Unless the lake is stirred by winds the water is warm. The hills and forests afford quiet retreats for study or strolls. The hills and roads give glimpses of scenery of rare beauty. At the proper season hunting is good. Deer have been seen annually a few rods from the laboratory. Grouse and pheasants abound in the hills. In season duck shooting is fine. A day's tramp will take one to the home of the Rocky Mountain goat. In a day one may penetrate a pathless forest or stand on craggy heights, where the view presents the jagged Rockies, the back bone of the continent.

DATE OF OPENING.

The laboratory work of the Station will begin Monday, July 18, and continue five weeks, or until Saturday, August 20. For a week or more before the Station opens some one on the staff will be at or near the Station, and will aid any who may choose to work during such time. The laboratory is at the disposal of students from June 15 to September 1st, or even later, if any wish to use it.

AFTER THE SESSION.

At the close of the work at the laboratory the station staff will carry on investigations and make collections in the vicinity; Senator Wm. A. Clark having made a contribution for this purpose.



Fig. 38. View northwest from the summit of MacDougall Peak in the Swan Range. The bald mountain is G. N. Behind it is the sharp summit Stimpson, from which waters flow to the three oceans. This view is but a small part of that to be seen by those who make the ascent of the Swan range annually. Photo by M. J. E.

EXPENSES.

The Station is a department of the University of Montana. The policy of the State Board of Education is to make all work of the University free to residents of the State. In conformity with this plan there is no tuition or laboratory fee charged. Students attending will pay for breakage. It is thus possible for students to come from remote sections of the State, spend six or eight weeks in study under the most favorable conditions, with the best facilities the State affords, at a minimum expense. Correspondence is invited. There is no similar work offered in the Northwest. Considering the difference in fees and the facilities for camp life attendance may be made with as little expense as at eastern stations from the same distance, with work in a new field, and with side trips and short expeditions such as no other station offers.



Fig. 37. View of the northern end of Mission range, showing glaciated hills. Fathead river and lake in foreground, Swan range in background. Swan river flows through the gap and into the lake on the left. As the laboratory is on the bank of the river the location is readily understood. Photo by Walter Lehman.

TO OUR EASTERN FRIENDS.

The laboratory has had students from a dozen states. No student has come to the mountains and gone away disappointed. Cheap railway rates make it possible to visit the west at a minimum cost. The Station affords a place where our scientific brethren may make headquarters, from which they may collect in almost virgin fields, scale unnamed heights and revel in mountains with grand scenery, seek the unknown in the pathless forest, under guidance of those who have spent years in this field. The Station fills a unique place in the work of the fresh water stations of the world. No other place in the world offers a more attractive or more varied field for study.

BIGFORK.

This is a village which has come into existence since the establishment of the laboratory in 1899. It has a postoffice with daily mail, sev-

eral stores, electric light, telephone, and many of the modern conveniences. It is not difficult of access.

HINTS FOR THOSE CONTEMPLATING ATTENDANCE.

Avoid bringing trunks. Large trunks are very difficult to handle, and transportation is expensive. Steamer trunks are less troublesome. If possible pack outfits in rolls, covered by canvas, fastened by large and strong straps. Hand baggage of any kind is not troublesome.

Outdoor and working clothing is adopted by all. Heavy shoes are a necessity. No other kind will stand the wear, if there is to be traveling.

Those who sleep in tents must remember the nights are always cool. A cheap tick, ready to be filled, and two comforts or heavy blankets over, with whatever is desired under the individual, are necessary. These can be purchased after arrival, if this is desired and at reasonable rate. In place of the preceding a sleeping bag is both a luxury and a necessity.

Reduce baggage to a minimum in weight. Heavy weight of books is not advisable, but reading matter for leisure moments should be brought.

For any further information address,

MORTON J. ELROD, Director,
Missoula, Montana.

For information concerning the University, its departments, courses of study, etc., address,

OSCAR J. CRAIG, President,
Missoula, Montana.



Fig. 40. A collecting party on Flathead Lake.

Fig. 39 View of Swan river just before it enters the lake. The lakefront is seen in the midst of the forest. The

